

February 18, 1914.

NEWS LETTER NO. 3.

THE DISPOSAL OF NURSERY STOCK AFFECTED BY CROWN GALL.

Dear Sir:

The Federal Horticultural Board was asked last year by one of the collaborating state inspectors for instructions governing the handling of imported nursery stock found infected with crown gall. The policy then defined, after consultation with specialists of the Bureau of Plant Industry, especially Dr. Erwin F. Smith and Mr. M. B. Waite, is now published for the information of the public, in response to repeated inquiries along the same line.

Crown gall is a communicable plant disease caused by the bacterial parasite Bacterium tumefaciens. This disease occurs naturally upon many kinds of fruit, ornamental, and other plants, of which the following may be named: apple; pear; quince; peach; apricot; almond; prune; plum; cherry; rose; Vitis vinifera, V. linsecomii, V. aestivalis, V. labrusca, and crosses between these species; Japanese honeysuckle; Arbutus unedo; Juglans regia; J. californica; J. nigra; raspberry; blackberry; loganberry; pecan; chestnut; poplar; alfalfa; hop; beet; salsify; turnip; parsnip; lettuce; red clover; paeony; cotton; Chrysanthemum frutescens; clematis; willow.¹

¹Hedgcock, G. G. The crown-gall and hairy-root diseases of the apple tree. United States Department of Agriculture, Bureau of Plant Industry. Bulletin 90, pt. 2, p. 5-7. 1905.

Smith, E. F. and Townsend, C. O. A plant-tumor of bacterial origin. Science, n. s., v. 25, p. 671-673. 1907.

Hedgcock, G. G. Field studies of the crown-gall of the grape. United States Department of Agriculture, Bureau of Plant Industry. Bulletin 183, p. 1-33. 1910.

Field studies of the crown-gall and hairy-root of the apple tree. United States Department of Agriculture, Bureau of Plant Industry. Bulletin 186, p. 1-108. 1910.

Smith, E. F., Brown, Nellie A. and Townsend, C. O. Crown-gall of plants: its cause and remedy. United States Department of Agriculture, Bureau of Plant Industry. Bulletin 213, p. 1-215. 1911.

It has been conclusively shown that the disease readily transfers from one host to another within very wide limits:

Hedgcock,² cross inoculated the disease between the almond,

²Hedgcock, G. G. The cross-inoculation of fruit trees and shrubs with crown-gall. United States Department of Agriculture, Bureau of Plant Industry. Bulletin 131, pt. 3, p. 21-23. 1908.

apricot, blackberry, cherry, peach, plum, prune, raspberry, apple, pear, chestnut, walnut and rose. He found that the crown gall of the last five did not very readily transfer to the other hosts and vice versa. Smith, Brown and Townsend (loc. cit.) successfully inoculated the disease from Chrysanthemum frutescens onto Chrysanthemum leucanthemum var.

pinnatifidum, C. coronarium, C. segetum, C. coccineum, Japanese chrysanthemum, Shasta daisy, Bellis perennis, Tragopogon porrifolius, tomato, potato, tobacco, oleander, radish, beet, carrot, Vitis vinifera, American grape (Martha), Trifolium repens, T. pratense, alfalfa, peach, almond, raspberry, pear,

cabbage, carnation, sugar beet, hop, Juglans regia var. pendula, Pterocarya fraxinifolia, Populus canescens. They also cross inoculated the bacteria secured from galls on many other plants. C. O. Smith¹ has successfully inoculated the disease

¹Smith, C. O. Further proof of the cause and infectiousness of crown gall. California Agricultural Experiment Station. Bulletin 235, p. 531-557. 1912.

from peach onto Prunus davidiana, P. amygdalus (hard shell and bitter almond), P. armeniaca, Myrobalan Wickson and Marianna prune, Mazzard and Mahaleb cherry, Juglans regia, J. nigra, J. californica and its variety hindsii, J. cinerea, J. sieboldiana, pecan, French pear, Bartlett pear, Chinese wild pear, apple, Angiers quince, Valencia orange, sweet lime, sour orange, lemon, Ficus carica, Muscat grape, climbing rose, Prunus integrifolia, Schinus molle, Sterculia diversifolia, S. acerifolia, Eucalyptus tereticornis. Negative results were given with loquat, Grevillea robusta, German prune, Prunus ilicifolia, Anona cherimolia, avocado and olive.

Hairy root is apparently a related trouble due to the same organism.

Crown gall is injurious to the trees or plants attacked. Some of them may thrive fairly well and make a partial success; others will struggle along and live for years as half failures; while still others will decline rapidly and soon die; and all diseased plants will serve as infection centers for other plants.

In view of these facts it is recommended, and in case of imported nursery stock inspected under the authority of the

Federal Horticultural Board, it is ordered that all plants clearly infected with crown gall shall be destroyed. Questionable or doubtful cases in a shipment containing a large proportion of trees or plants affected with crown gall should also be destroyed, but in general the destruction of uninfected stock is not advised.